Performance of toluene removal by activated carbon derived from durian shell.

Abstract

In the effort to find alternative low cost adsorbent for volatile organic vapors has prompted this research in assessing the effectiveness of activated carbon produced from durian shell in removing toluene vapors. Durian shells were impregnated with different concentrations of H 3PO 4 followed by carbonization at 500°C for 20min under nitrogen atmosphere. The prepared durian shell activated carbon (DSAC) was characterized for its physical and chemical properties. The removal efficiency of toluene by DSAC was performed using different toluene concentrations. Results showed that the highest BET surface area of the produced DSAC was 1404m 2/g. Highest removal efficiency of toluene vapors was achieved by using DSAC impregnated with 30% of acid concentration heated at 500°C for 20min heating duration. However, there is insignificant difference between removal efficiency of toluene by DSAC and different toluene concentrations. The toluene adsorption by DSAC was better fitted into Freundlich model.

Keyword: Durian shell; Acid phosphoric; Activated carbon; Toluene; Removal efficiency.